The occupational health of de-miners in Afghanistan

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SUMMARY

In the last few years there has been increasing awareness of the problems of landmines. This has focused on the ethics of landmine use, and the dangers to the local population of minefields. It has culminated in a much needed campaign for a moratorium on landmine manufacture. There are, however, millions of mines left in almost all parts of the world, which can create an indefinite hazard. The only solution is the slow and painstaking task of clearing these minefields. The health and safety of de-miners has not been previously discussed in any detail. This paper addresses the hazards to the people clearing minefields, with specific reference to the activities of the HALO trust in Afghanistan. De-miners are subject to the same hazards from mines as the general population, but put themselves at additional risk by entering minefields deliberately. These hazards can be controlled by a safe system of work and the appropriate use of personal protective equipment.

INTRODUCTION

Landmines have been in military use since the First World War, when they were used as a defence against tank attacks. Soon after this, anti-personnel mines were developed to prevent anti-tank mines being removed. Thus from the outset, landmines have been designed to make minefield clearance a slow and dangerous task. The minds of the designers are exemplified by the fact that modern mines are designed to mutilate and maim, rather than to kill, as injured soldiers are very damaging to the morale of their colleagues[1]. In orthodox warfare, mines were used to prevent flanking attacks on vulnerable positions. Modern warfare, however, is much more fluid, and mines are frequently left by retreating forces to deny an area to the opposition. Thus, mines are laid in village buildings, in agricultural land, and on roads. No attempt is made to map minefields, or even to define their boundaries. Other techniques involve dropping mines from aircraft, or using heavy artillery, to distribute mines randomly on enemy territory.

Once the war is over, however, the effect of landmines continues. In Afghanistan, for example, there has been fighting for over 14 years. In 1989 the Russians pulled out after years of guerilla warfare from the Mujehaddein, leaving a very shaky communist government who were soon deposed. Since then various groups have been fighting for control of some or all of the country[2]. During this period large areas were mined by all the combatants. As people return to their destroyed villages to rebuild their lives, they find the sites and their land has been mined. An unknown number die, particularly women and children, because medical facilities are very limited. In Afghanistan, 70% of all those injured by landmines require amputation, which often requires two or three separate operations[3].

Worldwide, estimates suggest that there are over 100 million landmines, in at least 27 countries[4]. At least 2500 people with mine injuries are brought to hospitals every week[5]. At the present rate of clearance, it will take at least 15 years to clear even the most important areas[3]. Thus the problem of minefield clearance is an urgent one.

Minefield clearance is a slow and laborious process, in which the surface of the ground is scraped away with a pointed rod (Figure 1). Metal detectors can help, but are not perfect, partly because there is so much metallic debris in old war zones, and because certain manufacturers are making mines with minimal metal content, so that they do not trigger detectors.

HALO

HALO (Hazardous Areas Life Support Organization) was founded in 1987. The purpose of the HALO Trust is to make the land safe for local people, to resume a normal life. Unfortunately, the resumption of fighting in Kabul means that, at the time of writing, HALO has been unable to return to Afghanistan in 1994. HALO is currently active in Angola, Cambodia and Mozambique. In each country the work is done by locally hired de-miners, supervised and trained by British ex-Servicemen.

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Figure 1 **De-miners clearing an area by scraping away the surface with a pointed rod**

Clearing minefields is a potentially hazardous activity, and to protect the de-miners it is essential to have a doctor available very soon after any accident. In Cambodia there is an excellent hospital run by the ICRC (International Commission of the Red Cross) nearby. In Afghanistan, Angola and Mozambique the Trust requires doctors to support mine clearance, and to provide a medical service to de-miners and the local population. Mine injuries in Afghanistan for the period 1992–1993 have been analysed, in order to review safe systems of work.

MINEFIELD CASUALTIES

Although any accident is one too many, HALO maintains a low accident rate for de-mining activities. There are no UK figures that will compare directly. In the period in question, nine de-miners were injured, and three killed in the accident mentioned earlier. It has been calculated in post-1945 Europe, one disposal expert was killed and two injured for every 5000 mines neutralized[3]. This is perhaps an unhelpful comparison, as differing geography and mine density will make a significant difference to risk, as will the availability of maps. The UK Health and Safety Executive[6] estimates that in the UK construction industry, injuries that require an absence of 3 days or more occur with an incidence of 1602 per 100 000 employees per annum. The equivalent HALO rate for 1993 is 2400 per 100 000 employees per annum.

PATTERNS OF INJURY

Three patterns of mine injury have been described[7].

Pattern 1 injury results from standing on a buried anti-personnel mine. The purpose of mines is to incapacitate anyone triggering them, so that as well as the casualty, other soldiers are taken out of combat to look after him. The usual injury is a traumatic amputation of the lower leg just beneath the knee. This would happen if a de-miner stepped outside a cleared area. This problem is avoided by ensuring that all de-miners have a clear understanding of safe systems of work.

There are ways that armies booby-trap such mines, to prevent de-mining. One is to place a second mine beside the first, so that it explodes when the first is removed. This can be avoided by minimal handling of discovered mines, and destroying the mine *in situ*. Another is to bury a mine more than 15 cm deep, out of range of a detector. The area will be assumed clear, then the soil over the mine will subsequently become compacted, until the mine explodes. The injury to one de-miner was of this type. There is little that can be done to prevent such an accident.

Pattern 2 injury results from being near an exploding mine. Several types of mine are designed to spread shrapnel over a wide area. Most are triggered by trip wires. Various penetrating injuries may result, some serious. When de-miners in Afghanistan probe mines they squat, which means that if a mine is detonated, most of the blast goes to the face. One recent accident was of this type. All de-miners are issued with safety glasses, and protective visors may be used in future. In another tragic case a de-miner needed his leg amputated at the hip because of shrapnel injury to the femoral artery. Blast jackets with lower extensions are being tried to see if they can prevent such an injury, although most de-mining takes place in hot countries, and additional garments may create heat stress.

Pattern 3 injury results from handling a mine, and involves traumatic amputation of part of the upper limb. Certain mines do not look dangerous, and some are attractive to children. This can be avoided by destroying anything suspicious *in situ*, with the minimum of handling.

Other types of injury may also occur during this type of work. The most serious accident occurred when a specially adapted tank with flails was being used to clear a minefield. Unfortunately, it triggered a booby-trapped anti-tank mine set up for precisely this purpose. As a direct result of this incident, two expatriates and an Afghani died of a combination of burns and smoke inhalation. One of the expatriates was posthumously awarded the George Medal for his actions.

There have also been road traffic accidents. Despite the poor quality of the roads and the nature of local driving styles, to date, none of these have caused serious injury. In Cambodia, de-miners have been attacked and seriously injured by the warring parties, but this has not happened in Afghanistan.

COMMENT

Mines cost less than £12 to purchase, but the UN calculates that they cost between £200 and £700 each to remove[8]. The only way to eradicate de-mining accidents is to ban mine

manufacture. Human rights organizations are pressing for this[5], and doctors should support such a ban.

Even if all mine production is stopped now, there are still enormous numbers of mines worldwide, and they are still being sown. Areas can only be made safe by the patient work of de-miners risking their own lives. Personal protective equipment is available, but does not eliminate all risks.

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